

IFW

PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/812,461
Filing Date	03/29/04
First Named Inventor	Hiroo Azuma
Art Unit	2811
Examiner Name	Unknown
Attorney Docket Number	CFA0007OUS

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): -Copy of cited references -Return post card
<input type="text"/> Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Canon U. S. A., Inc. IP Department		
Signature			
Printed name	Marlene Klein		
Date	3/4/05	Reg. No.	43,718

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Eri Maldonado	Date	3/4/05

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

The Application of:

Hiroo Azuma

Application No.: 10/812,461**Filed:** 03/29/2004

For: QUANTUM-STATE-
GENERATING APPARATUS, BELL
MEASUREMENT APPARATUS,
QUANTUM GATE APPARATUS, AND
METHOD FOR EVALUATING
FIDELITY OF QUANTUM GATE

Examiner: Unknown**Art Unit:** 2811**Confirmation No.:** 3151

January 10, 2004

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR § 1.97 and § 1.98

Sir:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and in accordance with the practice under 37 C.F.R. § 1.97 and § 1.98, the references cited on attached form PTO/SB/08B are being called to the attention of the Examiner. It is respectfully requested that the cited references be expressly considered during the prosecution of this application, and the references be made of record therein and appear among the "references cited" on any patent to issue therefrom.

As provided for by 37 CFR 1.97(g) and (h), no inference should be made that the information and reference cited is a prior art merely because it is in this statement and no representation is being made that a search has been conducted or that this statement encompasses all the possible relevant information.



Applicants believe that no fee is required for submission of this statement, since it is being submitted prior to the first Office Action. However, if a fee is required, the Commissioner is authorized to deduct such fee from the undersigned's Deposit Account No. 502456. Please deduct any additional fees from, or credit any overpayment to, the above-noted Deposit Account.

Respectfully submitted,

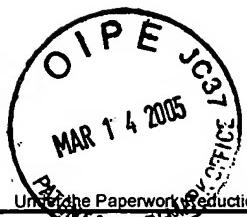
A handwritten signature in cursive script that appears to read "Marlene Klein".

Marlene Klein
Reg. No. 43,718

A handwritten date in a vertical orientation, reading "3/3/05".

CANON U.S.A., INC.
INTELLECTUAL PROPERTY DIVISION
15975 Alton Parkway
Irvine, CA 92618

Tel: (949) 932-3132
Fax: (949) 932-3560



PTO/SB/08B (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet

1

of

3

Complete if Known

Application Number	10/812,461
Filing Date	03/29/2004
First Named Inventor	Hiroo Azuma
Art Unit	2811
Examiner Name	Unassigned
Attorney Docket Number	CFA00070US

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	1	D. Deutsch and R. Jozsa, "Rapid solution of problems by quantum computation", Proc. R. Soc. London, Ser. A 439, 553-558 (1992).	✓
	2	D.R. Simon, "On the power of quantum computation", SIAM J. Comput. 26, 1474-1483 (1997).	✓
	3	P.W. Shor, "Polynomial-time algorithms for prime factorization and discrete logarithms on a quantum computer", SIAM J. Comput. 26, 1484-1509 (1997).	✓
	4	L.K. Grover, "Quantum mechanics helps in searching for a needle in a haystack", Phys. Rev. Lett. 79, 325-328 (1997).	✓
	5	C.H. Bennett, et al, "Teleporting an unknown quantum state via dual classical and Einstein-Podolsky-Rosen channels", Phys. Rev. Lett. 70, 1895-1899 (1993)	✓
	6	D. Bouwmeester, J.-W. Pan, K. Mattle, M. Eibl, H. Weinfurter, and A. Zeilinger, "Experimental quantum teleportation", Nature (London) 390, 575-579 (1997).	✓
	7	A. Barenco, et al, "Elementary gates for quantum computation", Phys. Rev. A 52, 3457-3467 (1995).	✓
	8	Q.A. Turchette, C.J. Hood, W. Lange, H. Mabuchi, and H.J. Kimble, "Measurement of conditional phase shifts for quantum logic", Phys. Rev. Lett. 75, 4710-4713 (1995).	✓
	9	C. Monroe, D.M. Meekhof, B.E. King, W.M. Itano, and D.J. Wineland, "Demonstration of a fundamental quantum logic gate", Phys. Rev. Lett. 75, 4714-4717 (1995).	✓
	10	E. Knill, R. Laflamme, and G.J. Milburn, "A scheme for efficient quantum computation with linear optics", Nature (London) 409, 46-52 (2001).	✓

Examiner Signature	Date Considered
--------------------	-----------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO				Complete if Known	
				Application Number	10/812,461
				Filing Date	03/29/2004
				First Named Inventor	Hiroo Azuma
				Art Unit	2811
				Examiner Name	Unassigned
Sheet	2	of	3	Attorney Docket Number	CFA00070US

NON PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			T ²
	11	T. Yamamoto, et al."Demonstration of conditional gate operation using superconducting charge qubitsNature (London) 425, 941-944 (2003).			✓
	12	J.S. Bell, "Speakable and unspeakable in quantum mechanics" (Oxford, Oxford University Press, 1983).			✓
	13	C.H. Bennett, D.P. DiVincenzo, J.A. Smolin, and W.K. Wootters, "Mixed-state entanglement and quantum error correction", Phys. Rev. A 54, 3824-3851 (1996).			✓
	14	R.F. Werner, "Quantum states with Einstein-Podolsky-Rosen correlations admitting a hidden-variable model", Phys. Rev. A 40, 4277-4281 (1989).			✓
	15	S. Popescu, "Bell's inequalities and density matrices: revealing "hidden" nonlocality", Phys. Rev. Lett. 74, 2619-2622 (1995).			✓
	16	P.G. Kwiat, et al, "New high-intensity source of polarization-entangled...", Phys. Rev. Lett. 75, 4337-4341(1995)			✓
	17	D. Gottesman and I.L. Chuang, "Demonstrating the viability of universal quantum computation using teleportation and single-qubit....", Nature (London) 402, 390-393 (1999)			✓
	18	A.C. Elitzur and L. Vaidman, "Quantum mechanical interaction-free measurements", Found. Phys. 23, 987-997 (1993).			✓
	19	L. Vaidman, "Are interaction-free measurements interaction free?", Opt. Spectrosc. 91, 352-357 (2001).			✓
	20	P. Kwiat, H. Weinfurter, T. Herzog, A. Zeilinger, and M.A. Kasevich, "Interaction-free measurement", Phys. Rev. Lett. 74, 4763-4766 (1995).			✓

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO		Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Application Number	10/812,461
		Filing Date	03/29/2004
		First Named Inventor	Hiroo Azuma
		Art Unit	2811
		Examiner Name	Unassigned
Sheet	3	of	3
		Attorney Docket Number	
		CFA00070US	

NON-PATENT LITERATURE DOCUMENTS

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.